**LESSON PLAN**

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| Faculty Name: **Dr. Nishtha Bhushan** Department**- Commerce** |
| Academic Year**: Jan-May,2022** Course: **B. Com (H)** Sem: **IV** |
| Paper No: **BCH 4.2** Subject: **Business Mathematics**

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| **UNIT** | ***TOPICS TO BE COVERED*** | ***LECTURE+ LAB*** | ***TEACHING METHODOLOGY AND TOOL*** | ***LEARNING OUTCOMES*** |
| **UNIT 1: Matrices and Determinants** | Definition and types of matrix, Algebra of matrices, Inverse of a matrix- Business Applications. Solution of system of linear equations using matrix inversion method and Cramer’s Rule. Leontief Input Output Model | 11 | * Inductive Deductive Approach: starts by discussing types of matrices, then solving some examples, then practice application oriented numerical problems using Black- board
 | * Developing skills to solve business and economics problem through matrices
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| **UNIT 2: Calculus I** | Mathematical functions and their types. Concept of Marginal Analysis. Concept of Elasticity, Applied Maxima and Minima problems including effect of Tax on Monopolist’s Optimum price and quantity, Economic Order Quantity. | 11 | * Start by revising economics concept like elasticity, monopoly and then correlating it with maximization and minimization concept
 | * Understanding real life application of maximization and minimization concepts of mathematics
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| **UNIT 3: Calculus II** | Partial Differentiation: Partial derivatives up to second order. Homogeneity of functions and Euler’s theorem. Total differentials. Differentiation of implicit functions with the help of total differentials. Maxima and Minima involving two variables – Applied optimization problems and Constraint optimization problems using Lagrangian multiplier involving two variables having not more than one constraint. Integration: Standard forms & methods of integration- by substitution, by parts and by use of partial fractions. Definite integration. Finding areas in simple cases Application of Integration to marginal analysis; Consumer’s and Producer’s Surplus. Rate of sales, The Learning Curve. | **16** | **-**Inductive approach to make students familiar with the applicability of integration into economical concepts like consumer and producer surplus or optimization of resources and usage of learning curve | * calculation to arrive at an optimum solution to business or economics problems
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| **UNIT 4: Mathematics of Finance** | Rates of interest: nominal, effective and their inter-relationships in different compounding situations. Compounding and discounting of a sum using different types of rates. Applications relating to Depreciation of assets and Equation of value. Types of annuities: ordinary, due deferred, continuous, perpetual. Determination of future and present values using different types of rates of interest. Applications relating to Capital expenditure, Leasing, Valuation of simple loans and debentures, sinking fund. | **10** | **-** Revision on topics like simple and compound interest, depreciation-Discussion in details on future value, present value, annuity, deferred annuity etc.- Use of log & antilog Tables, exponential Tables, Present/Future value of Tables | **-**Understanding real world application and calculation of interest in various cases |
| **Unit 5: Linear Programming** | Formulation of Linear programming problems (LPPs), Graphical solutions of LPPs. Various cases. Solution of LPPs by simplex method - maximization and minimization cases. Shadow prices of the resources, Identification of unique and multiple optimal solutions, unbounded solution, infeasibility and degeneracy. The dual problem: Formulation, relationship between Primal and Dual LPP, Primal and Dual solutions (excluding mixed constraints LPPs). Economic interpretation of the dual. | **17** | * Use of software package for solving linear programming problems, mathematics of finance problem and analyze the results obtained there from.
 | * Developing competency to use software for mathematical calculation to arrive at an optimum solution to business or economics problems
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